

N. J.; 18th, N. Y., Wis.; 20th, Wis.; 21st, N. Mex., (first seen,) Mass., Neb., Wis.; 22nd, Penn.; 23rd, Penn., Wis.; 24th, Iowa, Mass., N. C., Vt.; 25th, N. H.; 26th, N. Y., Penn.; 27th, Me., Ohio; 28th, Conn. *Thrush*, 6th, Mass.; 17th, Ohio. *Whip-poor-will*, 1st Fla.; 15th, Va.; 20th, Ill., Neb.; 21st, Iowa; 22nd, Ind., N. C.; 23rd, Md. *Woodpeckers*, 8th, W. Va.

FISHES.—*Shad*, 11th, Ardenia, N. Y., (first caught.) 13th, Flushing, N. Y., (first caught,) and numerous on the 18th.

INSECTS.—*Grasshoppers*, 7th, at Macon, Ga., blown thither by storm winds. 10th, Howard, Neb., first eggs hatched; Denison, Iowa, hatching during month; at Tabor, Iowa, but few hatched out. 13th, Fort Gibson, Ind. Ty., numerous; Corning, Mo., those hatched in February have disappeared. 23rd, Denison, Tex., first appeared. 30th, Creswell, Kan., nearly all gone; Corsicana, Texas, very numerous, corn and wheat damaged. *Colorado Beet'e, or Potato Bug*, 9th, Wappinger's Falls, N. Y.

Polar Bands.—N. H., Auburn, 1st, 4th, 16th. Miss., Brookhaven, 2nd. Iowa, Tabor, 5th, 18th; Iowa City, 10th, 14th, 16th, 24th; Muscatine, 24th. S. C., Charleston, 6th. Ohio, Carthage, 6th, 7th, 9th, 10th, 12th, 23rd. Ga., Tybee Island, 7th. Va., Wytheville, 7th, 9th, 15th. N. J., Vineland, 8th, Freehold, 22nd. La., Point Pleasant, 10th. Minn., Duluth, 14th, 29th. N. Y., Waterburg and Flushing, 14th; Malone, 24th. Me., Gardiner, 24th, 28th.

Prairie and Forest Fires.—Fort Randall, Dak., 1st, 3rd, 12th; Bismarck, Dak., 14th, 15th, 20th, 21st, 23rd; Monticello, Iowa, 8th; Creswell, Kan., 3rd, 4th, 5th, 6th, 7th, 10th, 13th, 19th, 20th, 29th; near Fall River, Mass., 22nd, raging for three days; St. Paul, Minn., 8th; Genoa, Neb., 15th; Eastport, Me., 27th; Wytheville, Va., 6th, 24th; Morgantown, W. Va., 13th, 14th; Embarrass, Wis., 13th, 22nd; near Scranton, Penn., 15th; Barnegat, N. J., 24th, 25th; Denison, Tex., 10th.

Meteors.—Iowa: Davenport, 1st; Monticello, 20th. Dak.: Yankton, 4th. N. Y.: Wappinger's Falls, 9th, 10th; Flushing, 10th; Vermillion, 11th; Waterburgh, 13th; Cooperstown, 15th. N. H.: Contoocookville, 12th; Auburn, 14th, 21st. Ind.: Vevay, 12th, 13th, 14th. Wis.: Wautoma, 13th. N. J.: Vineland, 14th. Ind.: Bloomington, 15th. D. C.: Washington, 22nd. Ohio: Jacksonburg, 25th. Va.: Wytheville, 27th. Vt. Woodstock, 30th.

Sunsets.—The characteristics of the sky, as indicative of approaching fair or foul weather, have been observed daily at sunset at all Signal Service stations. The monthly summaries from 88 stations show that 98 doubtful cases and blanks were recorded, and that out of the remaining 2,542 cases 2,108, or 82.8 per cent., have been followed by the expected weather.

Zodiacal Light.—Conn., Colebrook, 7th, 9th, 12th. Ga., Savannah, 5th, 6th, 14th. Iowa, Monticello, 1st, 2nd, 4th, 5th, 6th, 7th, 15th, 29th, 30th. Ohio, Bellefontaine, 5th, 9th, 12th. Me., Cornish, 11th. Mass., Somerset, 6th; Fall River, 3rd; Cambridge, 3rd, 6th, 9th, 12th. N. J., Atco, 5th, 6th, 7th, 10th, 12th, 14th, 15th, N. Y., Waterburgh, 2nd, 6th, 7th, 9th, 10th, 11th, 12th, 13th, 14th; North Argyle, 9th. Va., Wytheville, 5th, 6th, 14th, 29th.

Earthquakes.—Panama, 17th, slight shock of short duration, 5:50 a. m. Auburn, N. H., 23rd, slight shock from NW. to SE., at 11 a. m. A slight shock was felt at Franklin, N. C., at 5 p. m. of 26th.

NOTES AND EXTRACTS

In the Paris Comptes Rendus des Academie des Sciences de Paris, for March 12, 1877, and in the Bulletin International de l'Observatoire de Paris, for March 20th, M. de Crova gives some measures showing the variations of the solar heat as received at the earth's surface. Observations were taken on January 4th and July 11th, 1876, continuously throughout these remarkably clear and quiet days. The following are the results of his calculations:

Total amount of heat received at Paris upon one square centimeter.	JANUARY 4, 1876.		JULY 11, 1876.	
	Normally to sun's rays.	Upon a horizontal surface.	Normally to sun's rays.	Upon a horizontal surface.
	Calories.	Calories.	Calories.	Calories.
1st. Total from sunrise to noon.....	264.4	78.9	461.5	293.5
2nd. Total from noon to sunset.....	270.6	82.3	424.9	280.6
3rd. Total from sunset to sunrise.....	935.0	161.2	876.4	571.1
During the hours of sunshine the heat received in one minute varied from. }	0 to 1.20	0 to 0.33	0 to 1.21	0 to 1.10
The ratios of the total amounts of heat received daily upon normal and horizontal surfaces. }	$\frac{161}{535} = 0.301$		$\frac{571}{876} = 0.655$	
The ratios of the heat received on these two days are.....			Normally..... }	$\frac{535}{876} = 0.610$
			Horizontally. }	$\frac{161}{571} = 0.281$

In Poggendorff's Annalen, 1877, No. 1, page 31, Haga gives a further contribution to our knowledge of the absorption of the radiant heat by aqueous vapor. He shows that of the heat that emanates from a plate covered with lampblack and heated to 212° Fahr., probably 0.86 of 1 per cent. is absorbed in passing through a column of aqueous vapor 0.951 feet long at a temperature of 62° 6 or 64° 4 Fahr.; also 0.61 of 1 per cent. is absorbed in passing through a column of vapor 0.623 feet long at the same temperature; whence it follows that for a column of vapor 3,281 feet long at 62° 6 or 64° 4 Fahr., the absorption would be 3.1 per cent., and for a column 10,827 feet long the absorption is 10 per cent. In these experiments the heat rays had first passed through a small extent of the atmosphere of the room. Assuming that rays of all wave lengths are absorbed with equal facility we can now compute the absorption by a column, at any other temperature, and of any other length, and, consequently, that due to the moisture contained in the atmosphere at any time.

In a memoir by Leonardo de Tejada, on the hurricane of the 13th of September, 1876, the central track, as it passed over the West Indies, is charted as passing over the northern edge of St. Kitt's, then about 5 miles north of Santa Cruz, then directly through the centre of Porto Rico from Yabucoa on its southeast coast to Rincon at its northwest extremity, thence through the central portion of Hayti and the eastern half of Cuba. The greatest severity of the winds occurred at St. Kitt's on the 12th, 8:30 p. m.; at San Juan, 13th, 8:30 a. m.; at Yabucoa, 13th, 7 a. m.; at Rincon, 13th, 11:30 a. m.; at Porto Platte, Hayti, 13th, 8:30 p. m. In moving over the interior of the Island of Hayti its average hourly velocity was approximately 21.7 miles. The greatest hourly velocity of winds observed at San Juan, de Porto Rico, was from 62 to 80 miles. This storm is the same as that numbered VII in the Signal Service Weather Review for September, according to which, its central track lay a little to the east of Florida; it passed centrally over Wilmington on the 17th, at 8 a. m., and over Washington, at 5 p. m.

In the *Bulletino Meteorologico dell Osservatoire del Collegio Romano*, for March, is given the mean daily velocity of the wind as observed at Rome from 1862 to 1876. The annual periodicity is well shown by the following monthly means:

MONTH.	MEAN.	MONTH.	MEAN.
	Miles Daily.		Miles Daily.
January	124.5	July	130.3
February	106.2	August	124.0
March	140.4	September	110.0
April	117.2	October	115.5
May	120.9	November	123.1
June	122.4	December	127.2
		Annual	122.6

From the Appendix to the *Bulletin des Observatoire de Zi-Ka-Wei, China*, we compile the following table, based on four years of observations, 1873-'76, inclusive:

Zi-Ka-Wei, latitude 31° 12', longitude, 7h. 56m. east of Paris; altitude 23 feet.	Temperature in shade, Fahrenheit.				Force of vapor.		Relative humidity.	Cloudiness.	Number of rainy days.	Rain-fall.	Prevailing winds.
	Pressure.										
	Inches.	Mean.	Max.	Min.	Inches.	Per ct.				Inches.	
January.....	30.350	35° 4	60.1	16.5	0.173	82	6.2	8.2	2.28	NW	
February.....	30.250	40° 3	77.9	18.9	0.197	78	6.5	9.7	2.30	NE	
March.....	30.155	47° 1	78.6	29.8	0.264	78	6.6	14.0	3.19	NE	
April.....	29.995	57° 7	88.7	32.7	0.300	75	6.5	9.2	2.16	SE	
May.....	29.861	67° 3	96.3	37.4	0.508	77	6.4	6.6	1.93	SE	
June.....	29.749	72° 0	96.7	35.4	0.697	83	7.4	14.8	10.12	SE	
July.....	29.680	81° 7	102.0	66.0	0.878	81	6.4	8.0	1.69	SE	
August.....	29.741	80° 4	98.2	62.2	0.854	82	6.5	9.5	4.76	SE	
September.....	29.895	73° 4	95.5	44.2	0.673	81	6.8	9.2	5.65	NE	
October.....	30.107	63° 3	84.2	30.0	0.457	78	5.7	8.2	3.76	NE	
November.....	30.239	50° 7	78.1	26.4	0.295	74	8.9	4.3	0.70	NW	
December.....	30.786	43° 0	70.0	17.2	0.220	78	4.3	4.5	1.12	NW	
Year.....	30.026	59° 4	102.0	16.5	0.461	79	6.7	109.5	39.25		

For the same important station the following wind-rôses are given for the years 1875-'76:

Wind-direction.	Mean Pressure. Inches.	Mean Temperature. Fahrenheit.	Force of vapor. Inches.	Relative Humidity. Per cent.
N.....	30.036	56° 9	0.429	80.4
NE.....	30.028	59° 2	0.465	79.5
E.....	30.019	59° 8	0.483	80.7
SE.....	30.004	60° 8	0.485	79.5
S.....	29.983	63° 7	0.492	78.4
SW.....	29.940	63° 0	0.478	70.9
W.....	29.940	60° 4	0.467	74.6
NW.....	29.997	57° 7	0.412	78.1
N.....	30.036	56° 9	0.429	80.4
Average 1875 and 1876.....	30.001	60° 0	0.461	77.0

In the Resume for 1876 of the Commission de Meteorologie de la Haute Savoie, occurs the following passage relative to the thunder-storms of this Department of France. "Our thunder-storms ordinarily come from the southwest, but as often we see them follow the courses of the valleys without regard to the compass bearings; they are preceded by mists, rarely by cirri, then by clouds which generally grow denser and lower. At the same time the atmosphere is charged with electricity, and the fall of the barometer is irregular and saltatory * * * The occurrence of thunder-storms is subject to too many unknown circumstances to justify the risk of predicting them. There are some zones of thunder-storms which cover several departments, so that when the lightning starts at any point, the thunder-storms burst simultaneously over the whole area, and it is then already too late to send a telegraphic warning; at other times, on the contrary, the storm is dissipated before it matures."

In the Monatliche Übersicht der Witterung, January, 1877, der Deutsche Seewarte, the following items are given as the principal characteristics of the weather of Central Europe during January:

1. The large variations of barometric pressure, especially in the second half of the month (28.66 to 30.71 inches;) the monthly mean pressure was however near the normal value.

2. The large number of barometric minima which pursued their way through Central Europe; the most notable were those of the first and last days of the month.

3. The stormy weather attending these areas of low pressure, especially the great storms of the 1st and 2nd, and the 30th and 31st; on every day of the month, at one or more stations, a wind force was observed of 8, 9 or 10 of the Beaufort Scale, and during the 1st to 7th, and the 25th to 31st, storm winds prevailed over large areas.

4. The flood wave in East Friesland, accompanying the storm of 30th and 31st, (the highest of the century, except that of 1825); and the overflow in West Prussia, due to the extensive and long continued stoppage by ice.

5. The extraordinary high temperature, especially in the first half of the month, the excess of the monthly means above the normal values, ranges from +35.2 F., for the Baltic Provinces to +40.6 F., for Wurtemberg, +40.6 F., for Central Austria, +37.9 F., for Switzerland.

6. The large precipitation, which amounted to twice its usual amount in the Netherlands and some portions of Hanover and Lapsitz.

The verifications of the predictions, published by the Hamburg Seewarte, for January, which was an unusually unfavorable month, are announced as follows:

Month,	Weather. Per cent.	Wind. Per cent.	Temperature. Per cent.	Average.
Well verified.....	66	67	70	68
Partly verified.....	22	21	25	22
Not verified.....	10	12	5	10

In the Zeitschrift der Osterreichischen Gesellschaft für Meteorologie for 15th of March, Von Obermayer gives a clear presentation of the arguments for and against the existence of hollow vesicles of vapor in clouds, fogs, &c., and shows that we have reason to believe that such vesicles cannot possibly exist, and that all known phenomena are well explained as due to extremely small solid drops.

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Brig. Gen. (Bot. Assgd.) Chief Signal Officer, U. S. A.